BOEM ENVIRONMENTAL STUDIES PROGRAM: Planned New Study

Region: Pacific

Planning Area(s): Southern California, Northern California, Washington Oregon

Title: Archaeological and Biological Assessment of Submerged Landforms off the Pacific Coast (PC-14-04)

BOEM Information Need(s) to be Addressed: BOEM is required under multiple statutes (e.g., Outer Continental Shelf Lands Act, NEPA, Endangered Species Act, and National Historic Preservation Act) to consider the impacts of OCS activities on archaeological and biological resources. Currently, BOEM requires avoidance of areas identified through remote sensing data as having potential to be associated with submerged paleocultural landscape features. No ground-truthing, however, of any of these possible features has been conducted on the Pacific OCS. Additionally, submerged landforms may be associated with essential fish habitat (EFH) or other biologically sensitive areas, although it is unknown what geomorphological characteristics drive this sensitivity. The purpose of this study is to (1) use previously collected data of the seafloor to identify potential submerged landforms that could indicate the presence of prehistoric archaeological sites on the Pacific OCS, (2) collect fine-scale survey and coring data to ground-truth these features, (3) analyze and describe archaeological and biological resources associated with the subject features, and (4) develop a model that can be used to interpret remote sensing data and seafloor maps in other areas along the Pacific Coast in order to better identify submerged prehistoric sites and classify their associated resources. BOEM will use this information in NEPA documents, and NHPA, ESA, and EFH consultations, as well as government-to-government consultations with Native American tribes. Further, this information will inform decisions regarding lease sales, notices to lessees, information to lessees, and will be useful in developing mitigation measures.

Total BOEM Cost: TBD **Period of Performance:** FY 2014-2017

Conducting Organization: TBD

Principal Investigator: TBD

BOEM Contact: David Ball

Description:

Background: Because the spatial jurisdiction of BOEM lies entirely offshore beneath the surface of the water, a fundamental starting point that aids all phases of BOEM decisionmaking on the OCS is to characterize the seafloor. USGS and NOAA have conducted extensive hydrographic surveys along the Pacific Coast. Additionally, a nearly completed BOEM study, *Inventory and Analysis of Coastal and Submerged Archaeological Site Occurrence on the Pacific OCS* (POCS Inventory), will provide a digital elevation model of the Pacific OCS paleolandscape and an analysis of where potential offshore paleocultural landforms might be expected. The next step in the process is to identify areas that suggest a high potential for the presence of submerged

prehistoric sites and ground-truth some of these target areas. Paired with these archeological investigations will be a survey of submerged landforms potentially associated with EFH or other biologically sensitive areas. For example, the edge of the Hueneme Submarine Canyon (a submerged landform) hosts the only known skate egg nursery on the Pacific OCS (Love et al., 2008); other features may also be significant. This study will attempt to determine if landforms and sites are being identified correctly from the geophysical data acquired under guidelines published in NTL 2006-P03, and if these buried landforms actually are preserved prehistoric sites.

Objectives: The objectives of this study are to conduct field investigations of areas that have been identified as having a high potential to be associated with paleocultural landforms and develop and field test a geospatial model that will aid in the identification and classification of potential paleocultural landforms from existing remote sensing data and seafloor maps in areas along the Pacific Coast.

Methods: Four tasks will be performed.

(1) *Evaluate existing remote sensing data and review current theories on sea level rise during the Last Glacial Maximum (LGM) to identify high probability areas for further testing.* Extensive seafloor mapping data collected by BOEM, NOAA, and USGS, historical information on sea level changes, modeling from the POCS Inventory, and anthropological and biological information in the scientific literature will be used to identify submerged relict features that could represent paleolandforms and may function as loci for sensitive ecological resources.

(2) *Conduct fine-scale survey and ground-truth at least four submerged landform features.* Various methods will be used to ground-truth identified features, including state-of-the-art remote sensing technology (e.g., bathymetric echo sounders; side-scan and high-resolution [CHIRP] sub-bottom sonar; high penetration sub-bottom sonar; and magnetometers [for targeted application], remotely operated vehicles, and core samples). Cores will be taken from each site and analyzed to identify, date, and characterize potential archaeological sites and to assist in reconstructing the region's paleoenvironment. Video transects across the features will identify biological resources.

(3) *Analyze new data for possible indicators of prehistoric human activity and biological resources associated with paleolandforms.* Analysis for identifying potential paleocultural landforms will include, at a minimum, remote sensing and coring data collected through this effort, a review of existing theories on sea level rise during the LGM, human migration patterns, and terrestrial analogs, among others. Assessment of biological resources will include a seafloor habitat description according to the Coastal and Marine Ecological Classification Standard, and an estimate of the species richness and density of important species, including corals and managed fish species.

(4) *Develop and refine a model that can be used to interpret remote sensing data and seafloor maps in other areas along the Pacific Coast.* Analyses will include recommendations for processing future remote sensing data collected to support BOEM-permitted activities on the Pacific OCS and for appropriate survey parameters to better identify these resources.

Current Status: This study is expected to be awarded through an Interagency Agreement with USGS and/or NOAA.

Final Report Due: TBD

Publications Completed: None at this time.

Affiliated WWW Sites: None at this time.

Revised Date: September 30, 2013